

REMARKS

Reconsideration of this application is requested. Claims 1-16 remain in the application. One change of an editorial nature have been made to the specification as shown above. An Appendix showing a marked-up version of the changed paragraph is enclosed.

In the Detailed Action portion of the Office Action, claims 1-13 have been rejected under 35 U.S.C. §102(b) as being anticipated by Mueller et al. (United States Patent No. 6,097,263). Mueller et al. has been cited as disclosing a varactor as shown in Figure 16 comprising a substrate (512), a first conductor (504a) positioned on a surface of the substrate, a second conductor (504b) positioned on the surface of the substrate forming a gap (516) between the first and second conductors, a tunable dielectric material (508) positioned on the surface of the substrate and within the gap, the tunable dielectric material having a top surface, at least a portion of the top surface being positioned above the gap opposite the surface of the substrate (figure 16), and a first portion of the second conductor extending along at least a portion of the top surface of the tunable dielectric material.

This rejection is traversed. Claim 1 of the present application includes, among other things, first and second conductors positioned on a surface of a substrate to form a gap between the first and second conductors, and a tunable dielectric material positioned on the surface of the substrate and within the gap, with at least a portion of a top surface of the tunable dielectric material positioned above the gap opposite the surface of the substrate, and a first portion of the second conductor extending along at least a portion of the top surface of the tunable dielectric material. It is respectfully submitted that Mueller et al. neither discloses nor suggests this structure. Figure 16 of Mueller et al. shows a first conductor (504a) and a second conductor (504b) positioned on a surface (506) of a thick film dielectric material (508), which is deposited on the and electrically insulating, low electric permittivity substrate (512), see column 10, at lines 40-45. A gap (516) is formed between the electrodes. Figure 16 does not show electrodes on a surface of a substrate or a tunable dielectric material positioned in the gap. In addition, Figure 16 does not show a portion of a top surface of the tunable dielectric material positioned above the gap opposite the surface of the substrate, or a first portion of the second conductor extending along at least a portion of the top surface

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of the tunable dielectric material. Thus there are significant structural differences between the device defined by claim 1 of the present application and the device taught by Mueller et al.

In the present invention, the first portion of the second conductor that extends along at least a portion of the top surface of the tunable dielectric material forms a top electrode. As stated in the present application, on page 7 at lines 30-31, for a certain thickness and dielectric constant of the tunable dielectric film, the pattern and arrangement of the top electrode are key parameters in determining the capacitance of the varactor. Mueller et al. neither discloses nor suggests a structure having a conductor positioned on a surface of a substrate, with a portion of the conductor forming a top electrode.

Regarding claim 2, Mueller et al. has been cited as disclosing a varactor wherein a portion of the tunable dielectric material lies along a surface of the first conductor opposite the surface of the substrate (as shown in figure 1). Since claim 2 depends from claim 1, this rejection is traversed for the reasons set forth above with respect to the traversal of the rejection of claim 1, and for the following reasons. Claim 1 requires that the first conductor is positioned on the surface of the substrate and claim 2 requires that a portion of the tunable dielectric material lies along a surface of the first conductor opposite the surface of the substrate. Mueller et al. neither discloses nor suggests that the first conductor is positioned on a surface of the substrate and that a portion of the tunable dielectric material lies along a surface of the first conductor opposite the surface of the substrate.

Regarding claim 3, Mueller et al. has been cited as disclosing a varactor wherein the first portion of the second conductor has a rectangular shape (as shown in figure 16). Since claim 3 depends from claim 2, this rejection is traversed for the reasons set forth above with respect to the traversal of the rejection of claim 2. In addition, claim 3 contains additional shapes that are neither disclosed nor suggested by Mueller et al.

Regarding claims 4 and 11, Mueller et al. has been cited as disclosing a varactor wherein the tunable dielectric layer comprises LiTaO₃ (column 14, lines 57-60). Since claim 4 depends from claim 3, and claim 11 depends from claim 1 these rejections

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are traversed for the reasons set forth above with respect to the traversal of the rejection of claim 3 and 1 respectively. In addition, claims 4 and 11 contain additional compounds that are neither disclosed nor suggested by Mueller et al.

Regarding claims 5, 8 and 13, Mueller et al. has been cited as disclosing a varactor wherein the substrate comprises Al_2O_3 (column 10, lines 50-51). Since claim 5 depends from claim 4, claim 8 depends from claim 7 (which depends from claim 3), and claim 13 depends from claim 1 these rejections are traversed for the reasons set forth above with respect to the traversal of the rejection of claim 4, 3 and 1 respectively. In addition, claims 5, 8 and 13 contain additional compounds that are neither disclosed nor suggested by Mueller et al.

Regarding claims 6, 9 and 10, Mueller et al. has been cited as disclosing a varactor wherein the first portion of the second conductor overlaps a portion of the first conductor (column 11, lines 34-35). Since claim 6 depends from claim 5, claim 9 depends from claim 8, and claim 10 depends from claim 1 these rejections are traversed for the reasons set forth above with respect to the traversal of the rejection of claim 5, 8 and 1 respectively.

Regarding claims 7 and 12, Mueller et al. has been cited as disclosing a varactor wherein the tunable dielectric layer comprises barium strontium titanate (BSTO-CaTiO_3) (column 3, lines 41-45). Since claim 7 depends from claim 3 and claim 12 depends from claim 1 these rejections are traversed for the reasons set forth above with respect to the traversal of the rejection of claims 3 and 1 respectively. In addition, claims 7 and 12 contain additional compounds that are neither disclosed nor suggested by Mueller et al.

In the Detailed Action portion of the Office Action, claims 14-16 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Mueller et al. (United States Patent No. 6,097,263) in view of Rutt (United States Patent No. 3,879,645).

Regarding claims 14-16, Mueller et al. has been cited as disclosing all of the limitations of claim 1 [sic], except for the first conductor comprising one of: platinum, platinum-rhodium, and ruthenium oxide, and a second conductor comprising one of: gold, silver, coppers platinum, and ruthenium oxide. Rutt has been cited as teaching the conductors comprising platinum (column 10, lines 8-13) and silver (column 14, lines 49-56). It was considered to be obvious to one of ordinary skill in the art at the

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time the invention was made to modify Mueller as taught be Rutt to have conductors made of platinum and silver, because these materials have high conductivity for the varactor.

This rejection is traversed. Since claim 14 depends from claim 1, claim 15 depends from claim 14, and claim 16 depends from claim 1 these rejections are traversed for the reasons set forth above with respect to the traversal of the rejection of claim 1. In addition, claim 14 contains the additional materials platinum-rhodium, and ruthenium oxide that are neither disclosed nor suggested by Mueller et al. Similarly claims 15 and 16 contains the additional materials gold, copper, and ruthenium oxide that are neither disclosed nor suggested by Mueller et al.

The application is believed to be in allowable form. Allowance of the application is requested.

Respectfully submitted,

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